

ABSTRACT

Potato crops in Indonesia are frequently threatened by leaf blight diseases such as early blight and late blight. Manual identification by farmers is often inefficient and prone to errors, leading to delayed treatment and yield loss. This study aims to develop an automated detection system using potato leaf images to classify leaf conditions into early blight, late blight, or healthy. A deep learning approach using the YOLOv8 object detection algorithm was implemented due to its accuracy and speed. A dataset of 1,253 annotated images was expanded through augmentation techniques. The model was trained with different optimizers, and Stochastic Gradient Descent (SGD) produced the best performance. The final model was deployed into a web application using Streamlit for real-time detection. Experimental results show strong model performance, achieving a mAP@0.5 of 0.866. Detection for early blight and healthy leaves was highly accurate, with F1-scores of 0.880 and 0.835, respectively. However, late blight detection showed lower recall, indicating the need for further improvement.

Keywords: *disease detection, potato, potato leaf, YOLOv8, deep learning, digital image, agriculture.*